

Is it a bulla or a pneumatocele?

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We read with great interest the case report recent article by Fan *et al.* [1], which presents the clinical course of simultaneous left side spontaneous pneumothorax and sub-pleural thin-walled cystic air space (according to the authors giant bulla) in a COVID-19 patient. The authors managed the bullae conservatively and chest computed tomography scan performed 92 days after diagnosis showed complete resolution. We have some comments and want to share our experience with a similar case.

Both bullae and pneumatocele are thin-walled pseudocysts (not lined by epithelium tissue). Radiologically, it may be difficult to differentiate between both conditions, but pathologically each entity has distinct features. Bullae result from destruction of alveoli resulting in an air space with fibrous wall and possible intracystic trabeculae representing remnant of interalveolar septae [2]. On the other hand, different mechanisms were postulated to explain the pathogenesis of pneumatocele. Most authors attribute the pathogenesis of pneumatocele to endobronchial check valve mechanism allowing air trapping and distal development of cystic air space [3]. Another theory postulates that inflammation and necrosis of a portion of the airway results in direct communication between the airway and the bronchovascular interstitium. Air then dissects within the bronchovascular connective tissue up to the pleura, where it accumulates and forms a grossly identifiable pneumatocele [4]. Accordingly, whatever the underlying mechanism, air will accumulate within the lung parenchyma and the wall of the pneumatocele will be formed of lung tissue.

In our patient, we had the opportunity to surgically remove the roof of the air space cyst; and histopathologic examination of the resected material showed thin pieces of parenchymal tissue with significant fibrosis, inflammatory cell infiltration, and marked intra alveolar haemorrhage. This picture is consistent with pneumatocele nature.

Previous experience demonstrated that the majority of pneumatocele regress in size and resolve spontaneously [5]. This is not the situation with bullae, which tend to increase in size with time. We think that cystic air spaces that develop during pulmonary infectious processes like COVID-19 should be termed as pneumatoceles rather than bullae.

Conflict of interest: none declared.

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The corresponding author of the original article [1] was invited to reply but did not respond.

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